

Stimulating light 108

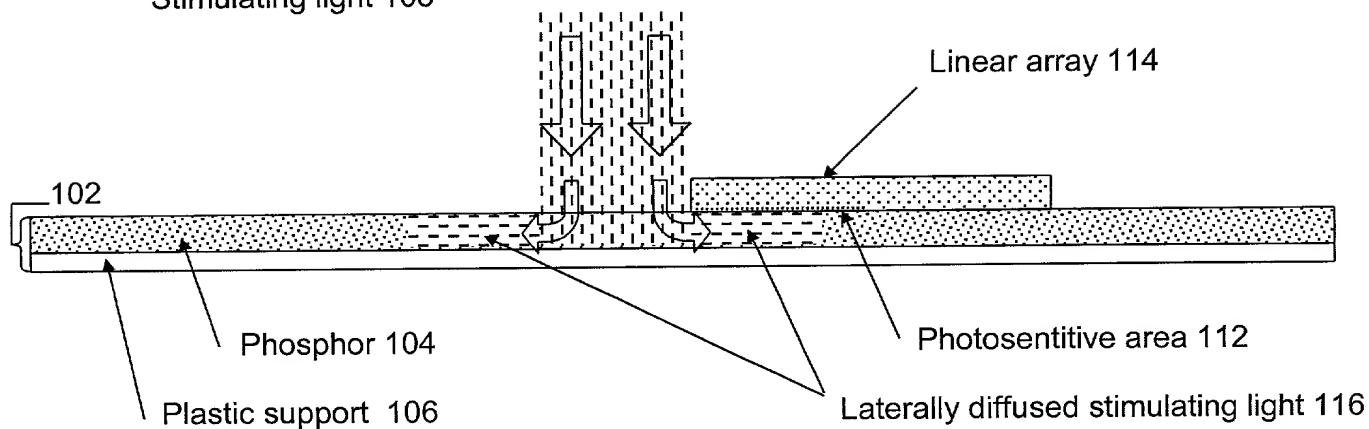


Fig.1

Stimulating light 208

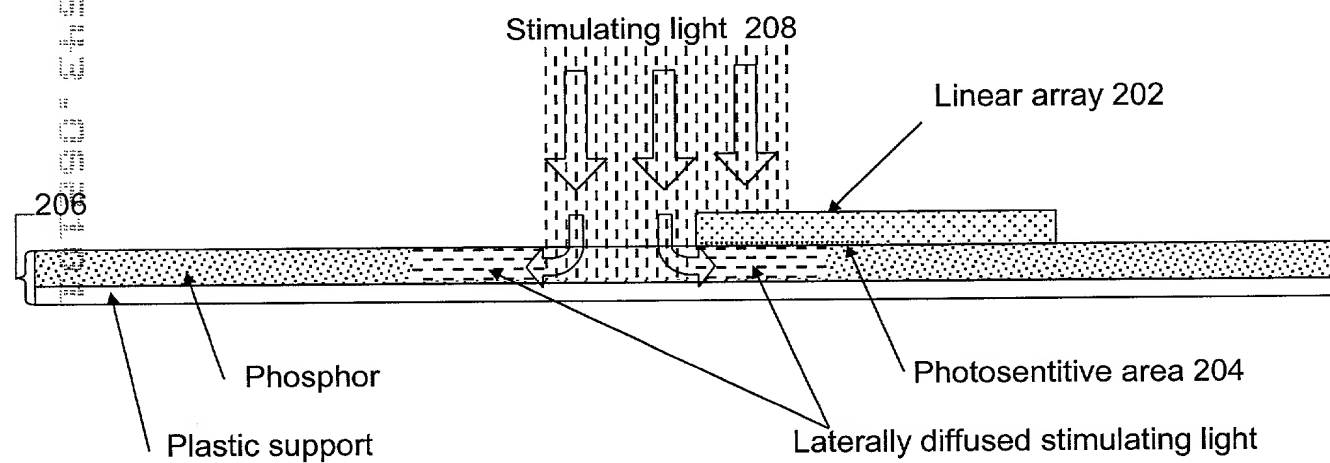


Fig.2

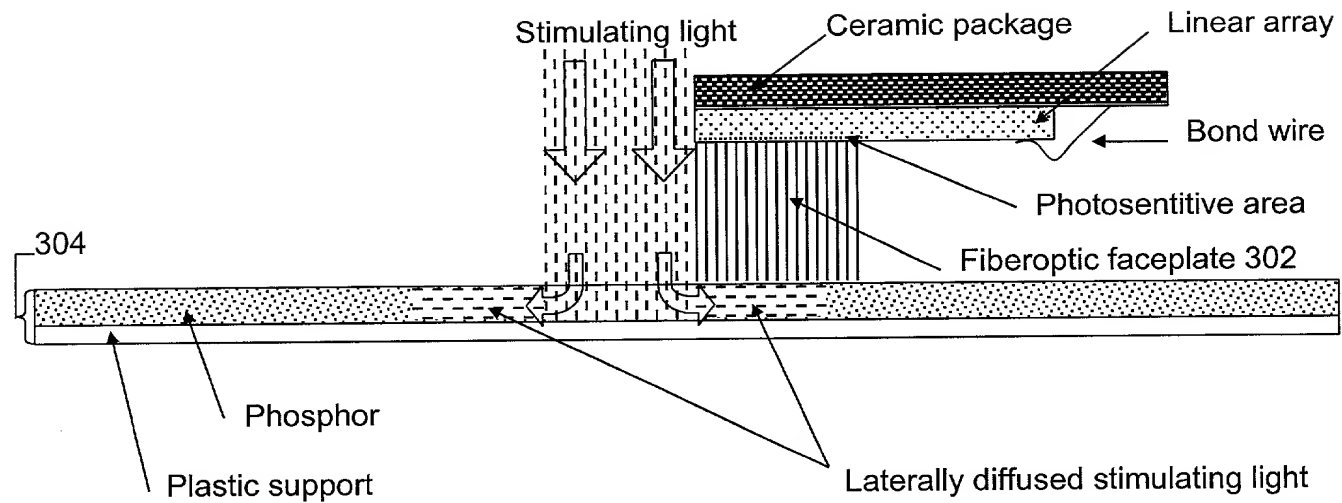


Fig.3

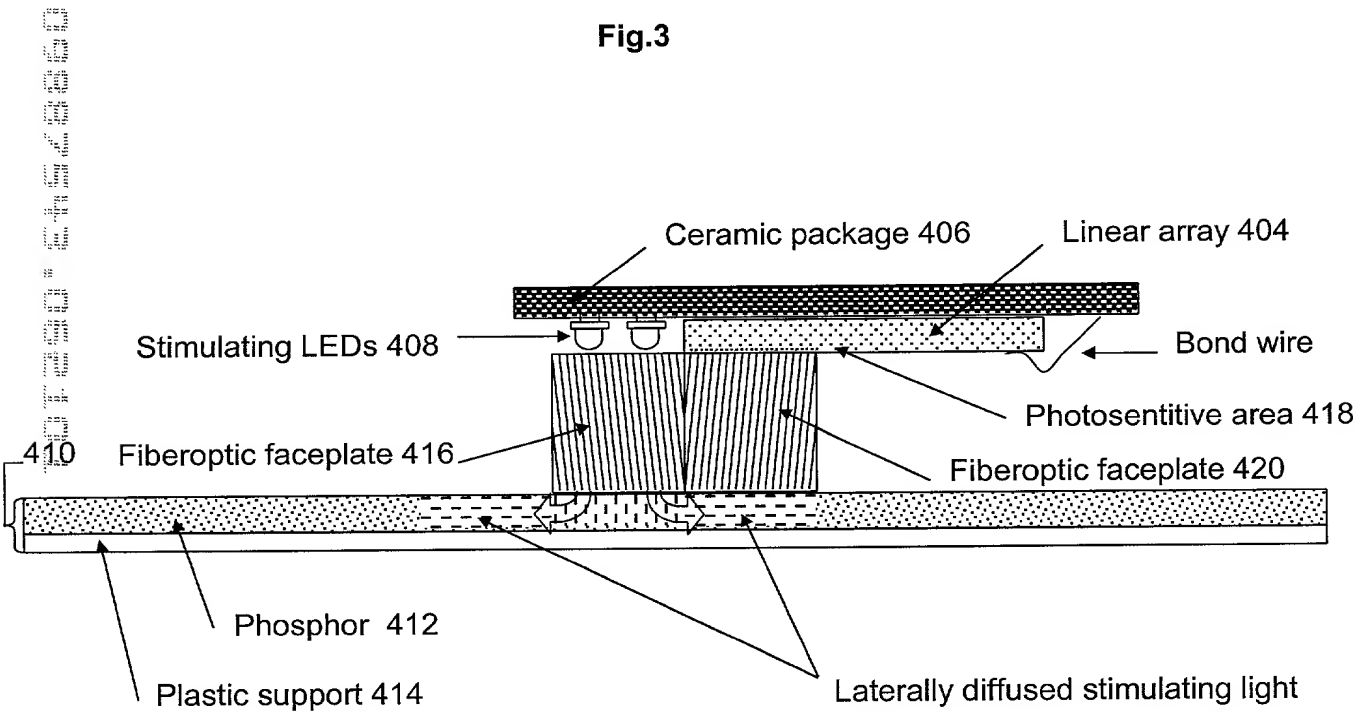


Fig.4

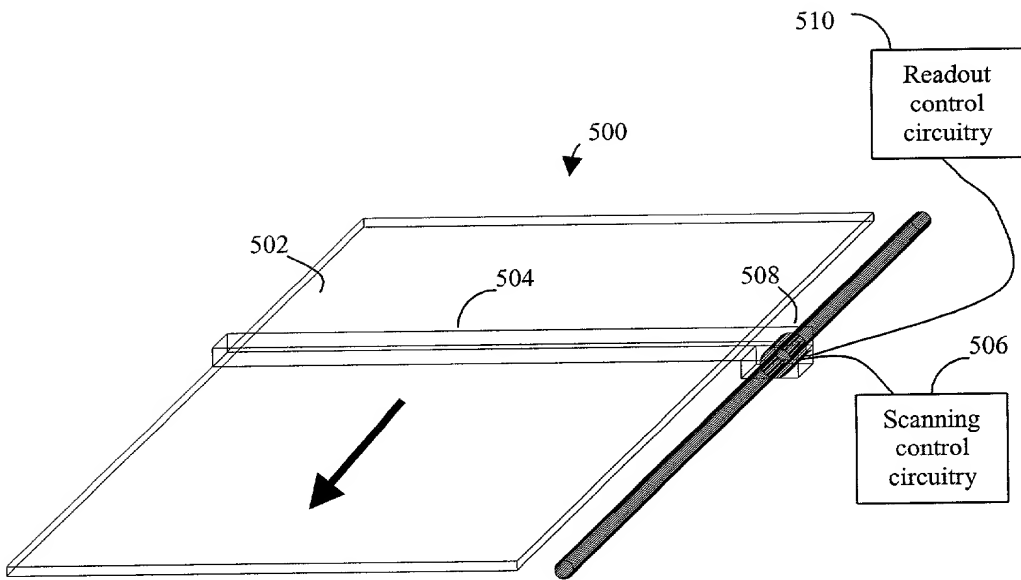


Fig.5

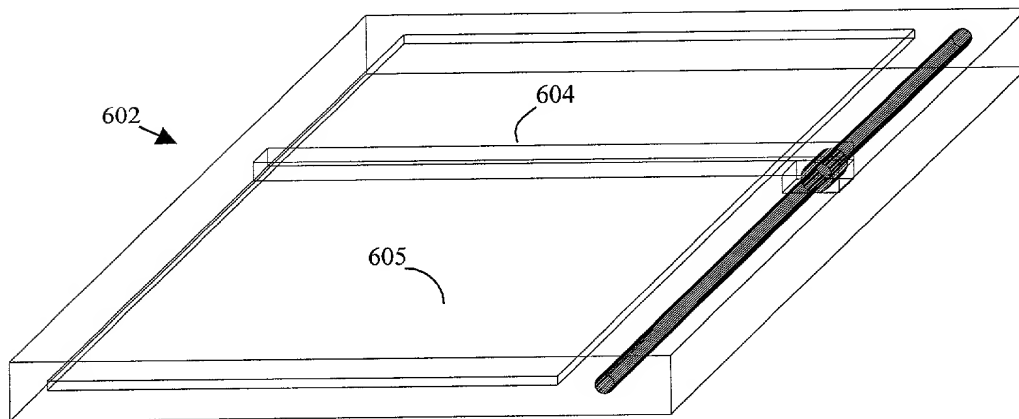


Fig.6

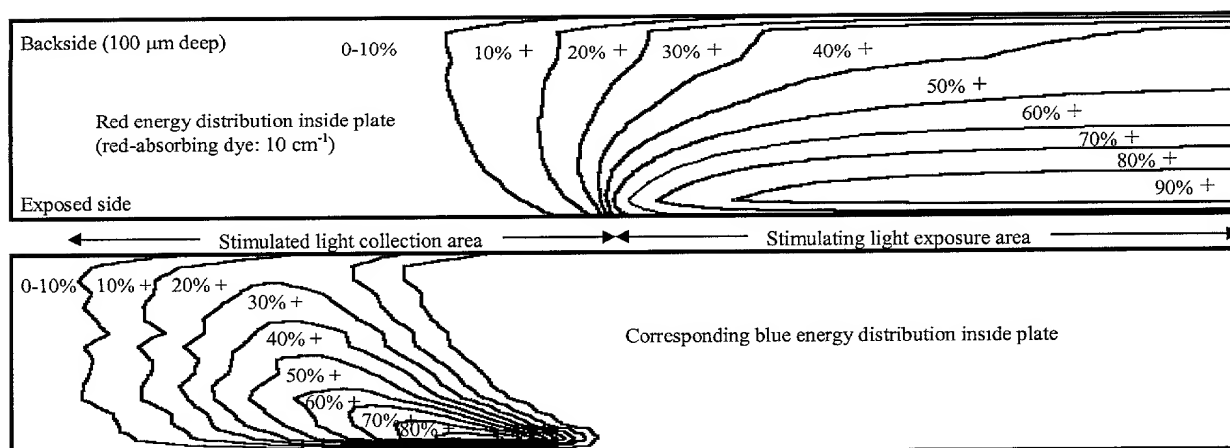


Fig. 7a

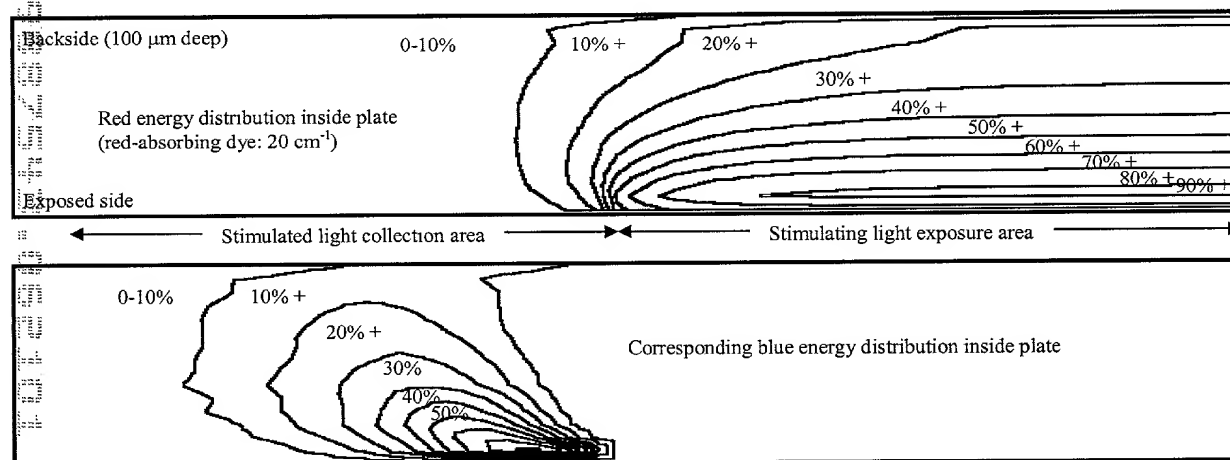


Fig. 7b

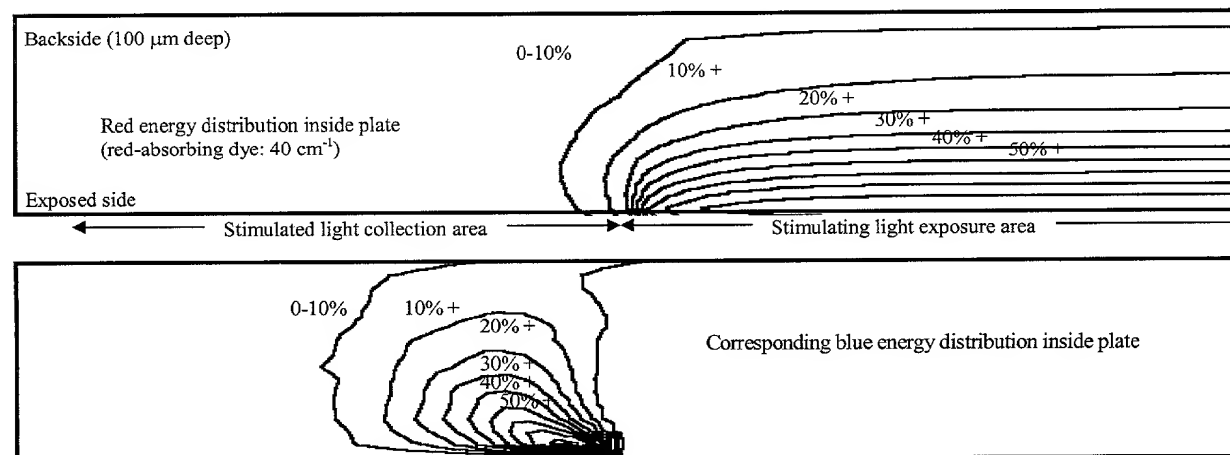


Fig. 7c

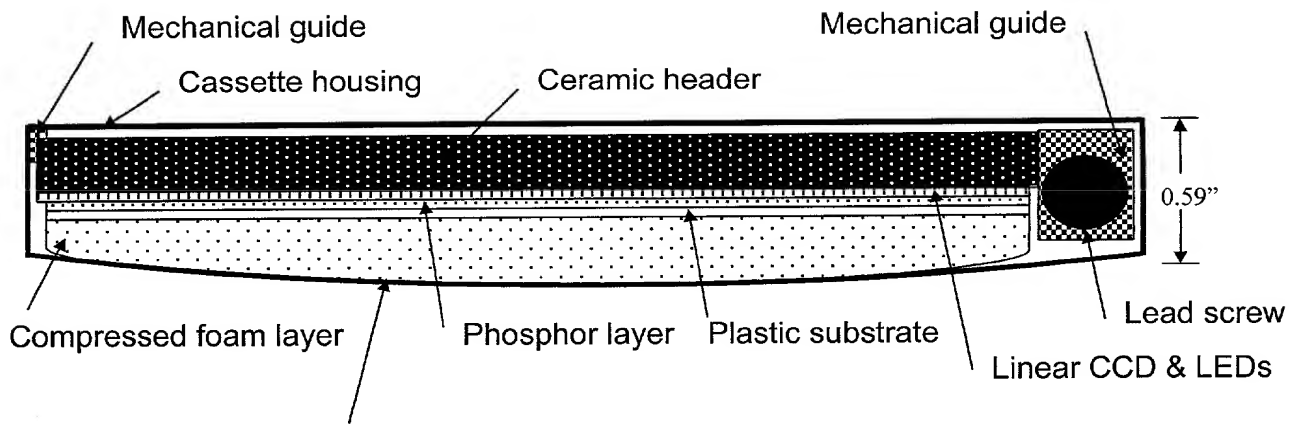


Fig. 9

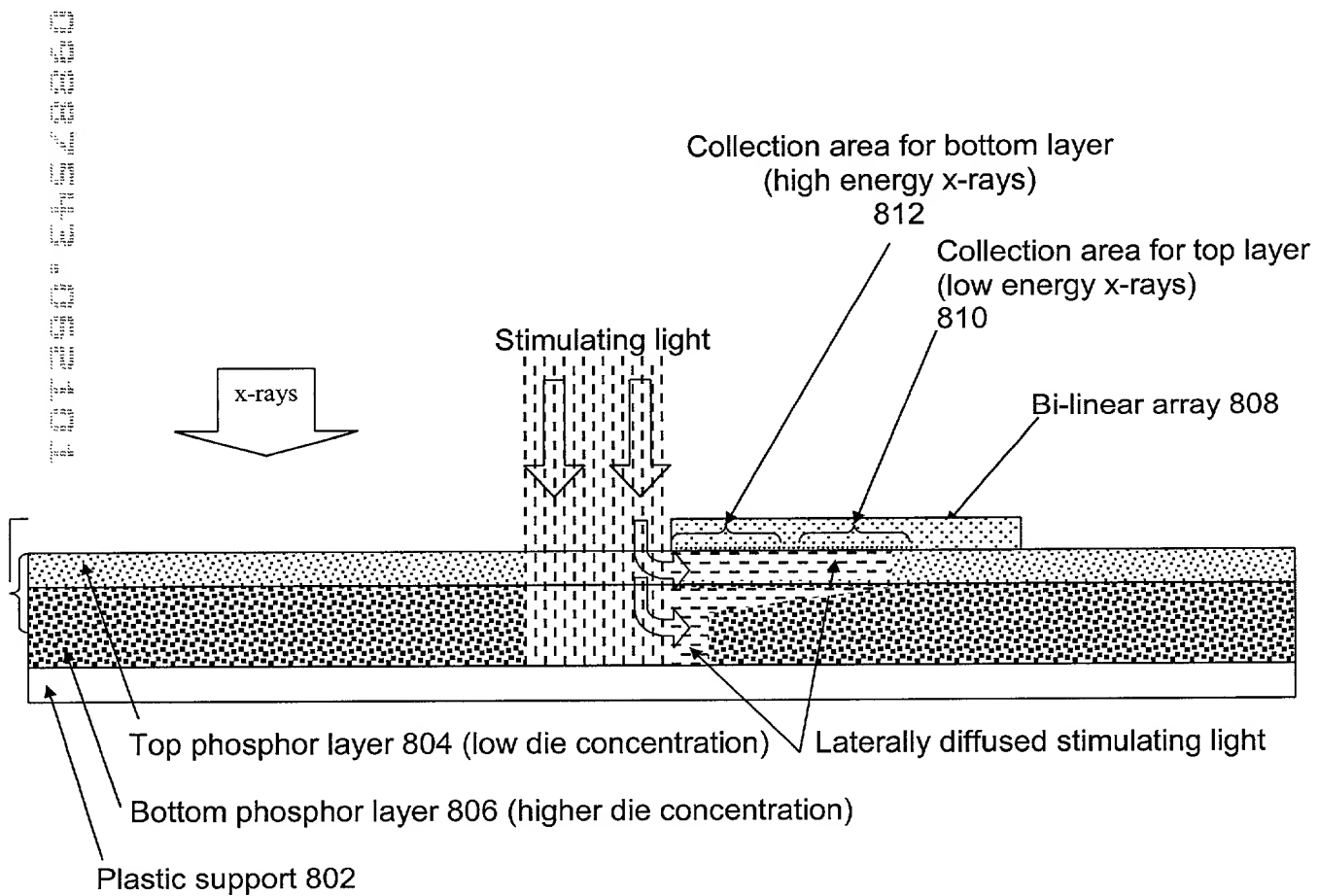
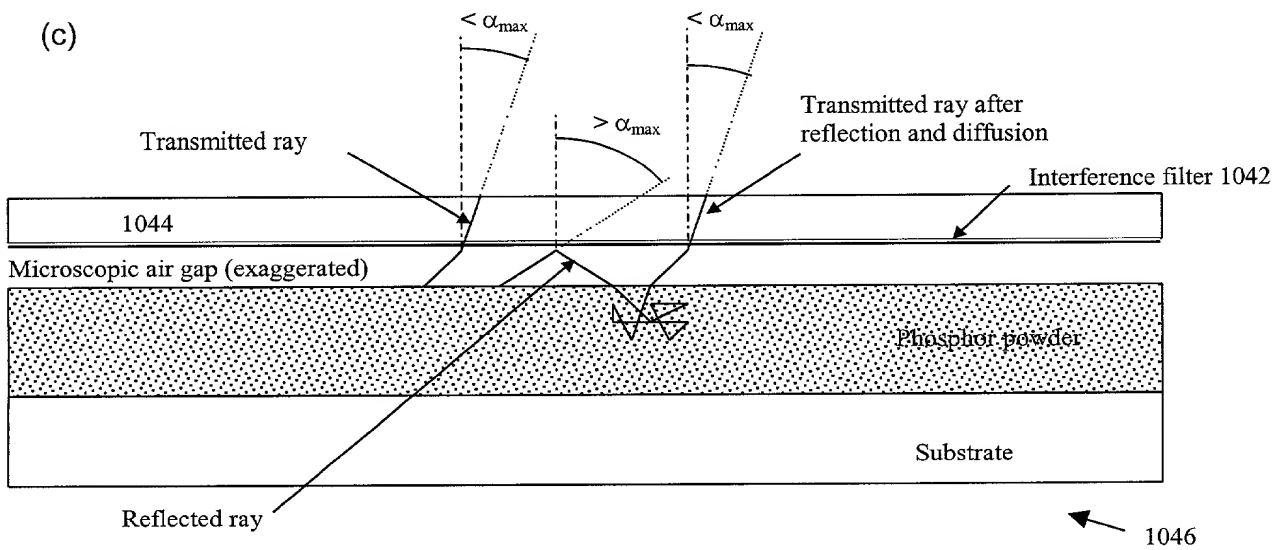
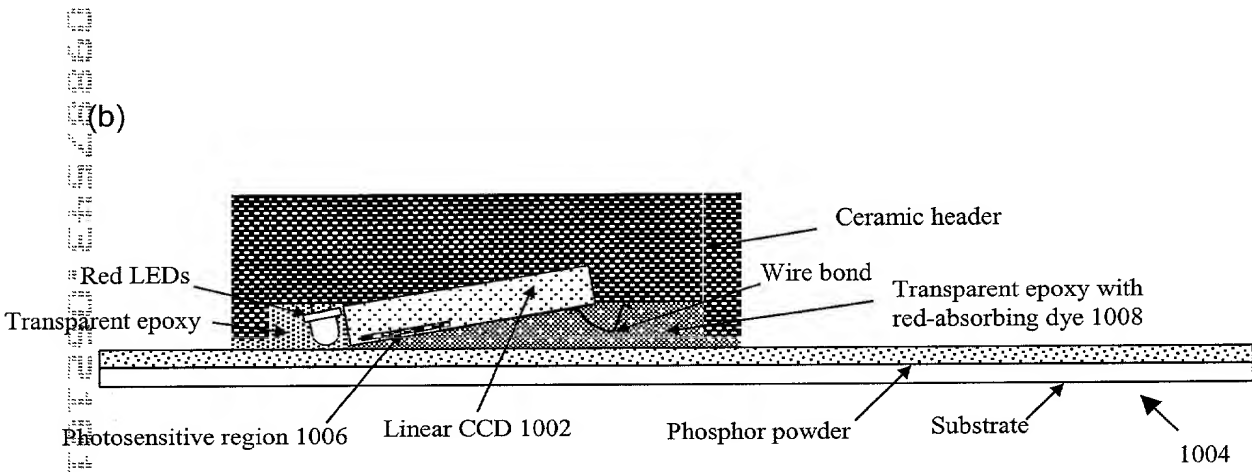
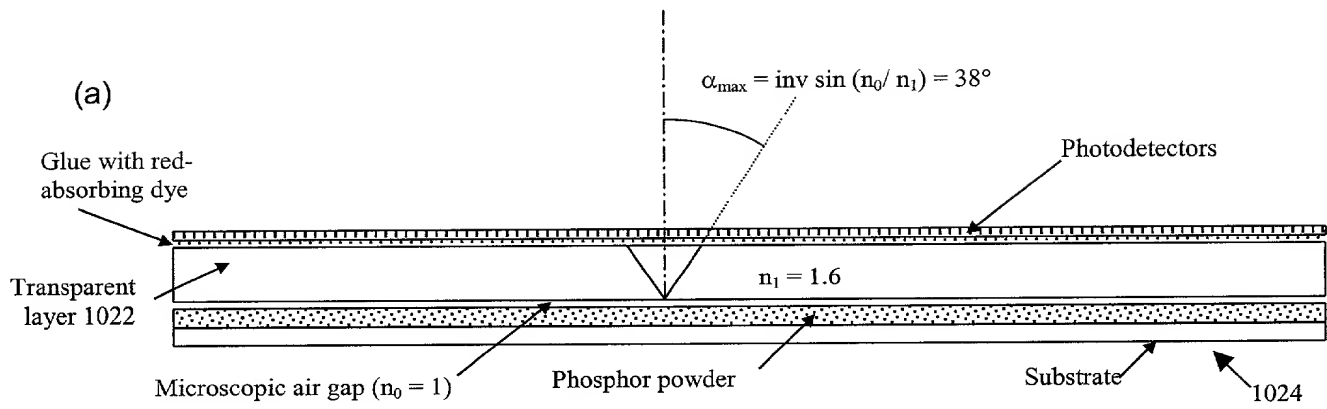
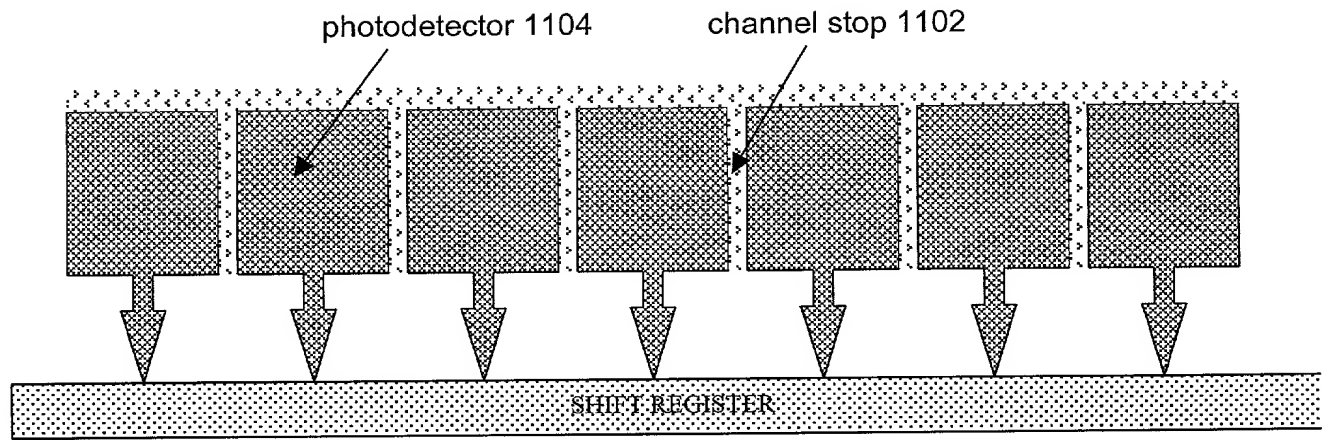


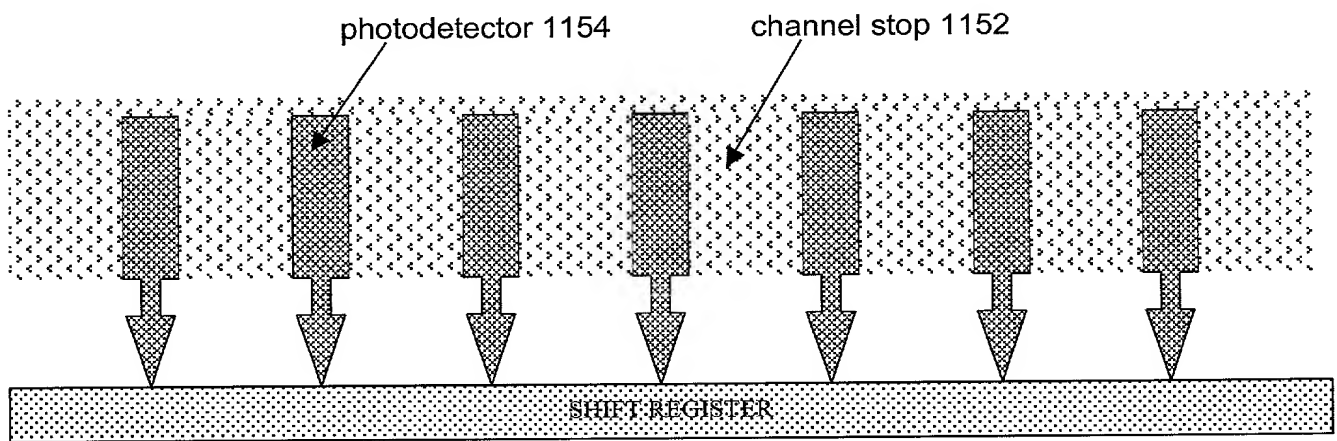
Fig. 8

Fig.10





(a) Prior art



(b) design

Fig. 11

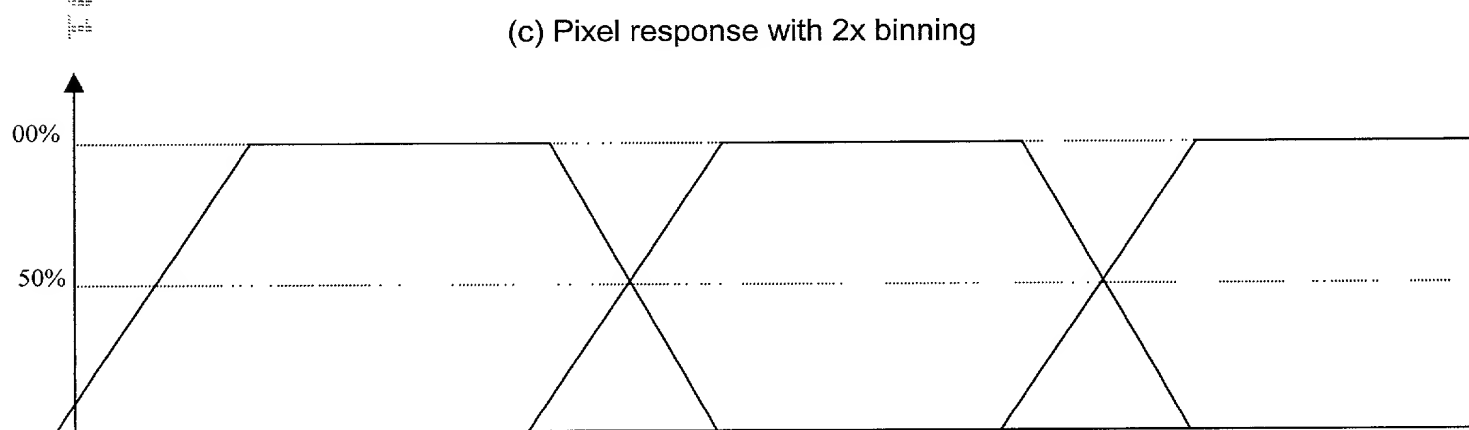
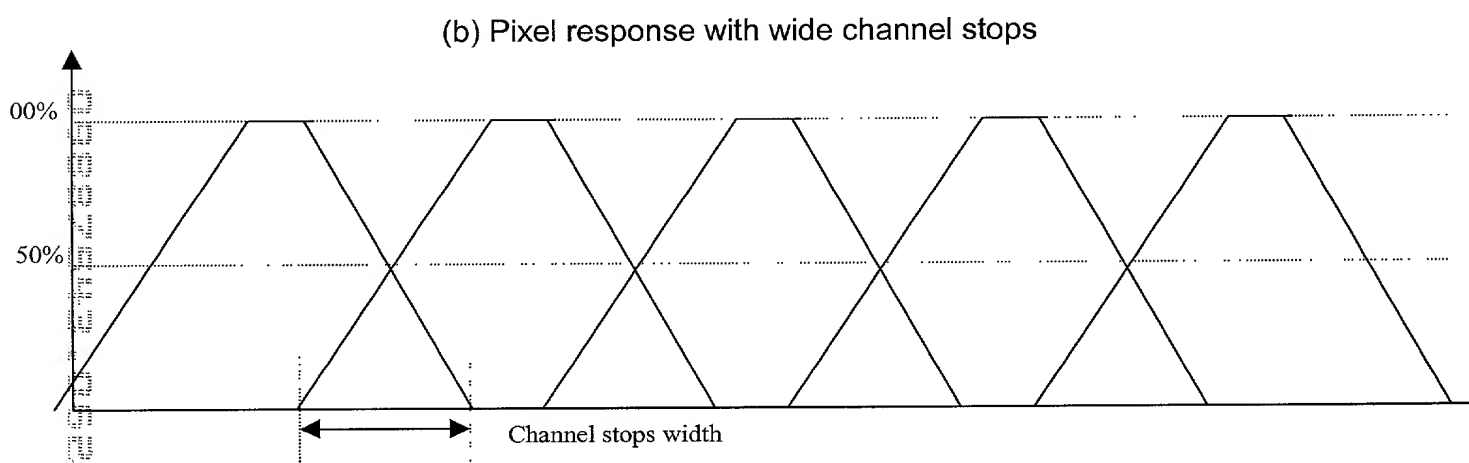
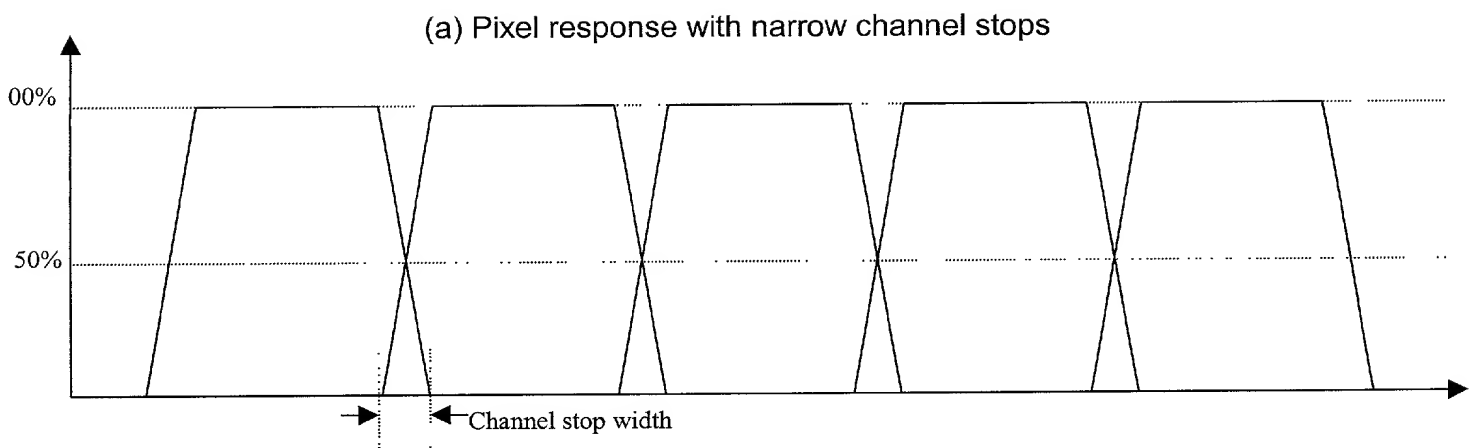


Fig. 12

Fig. 13

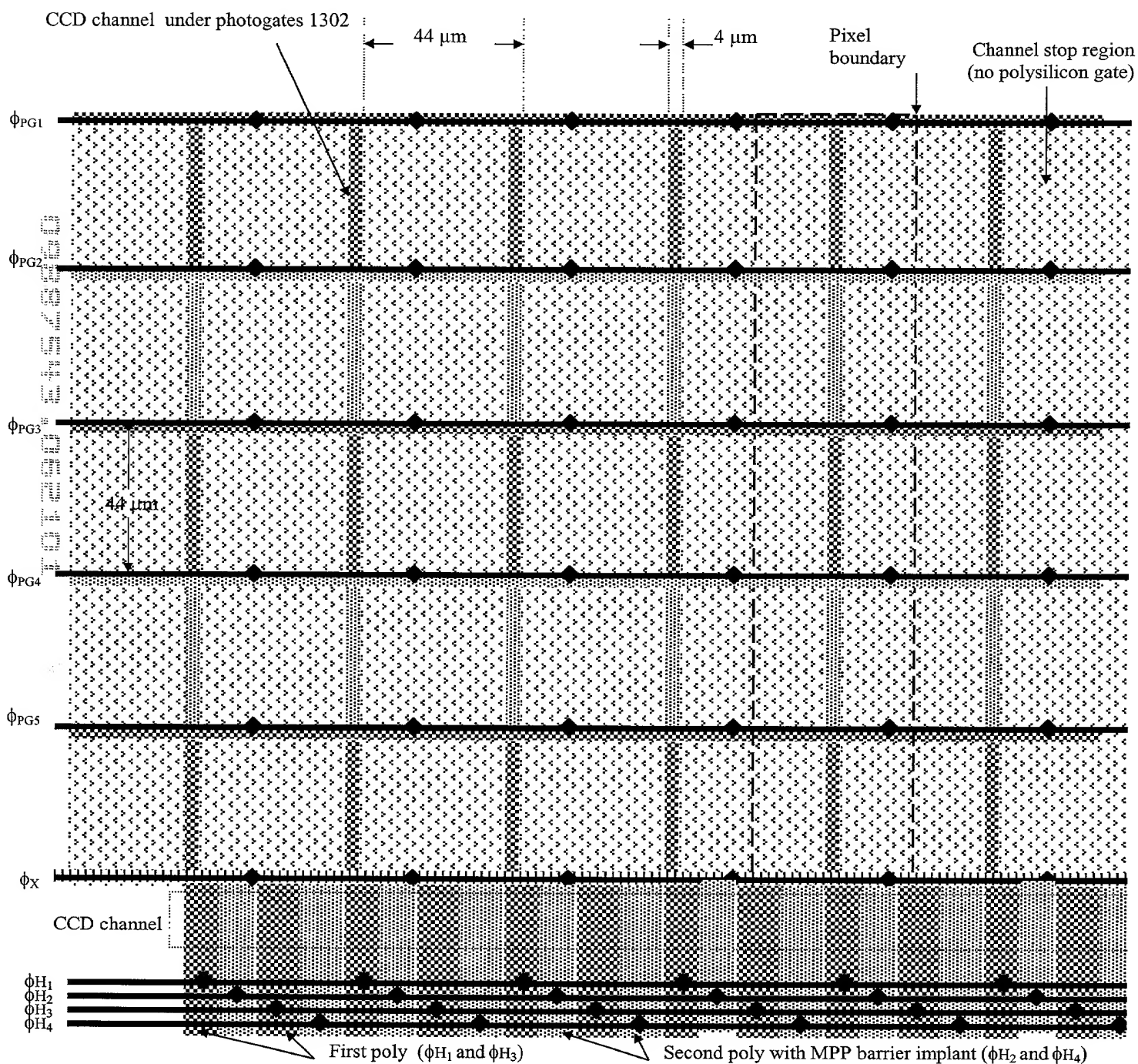
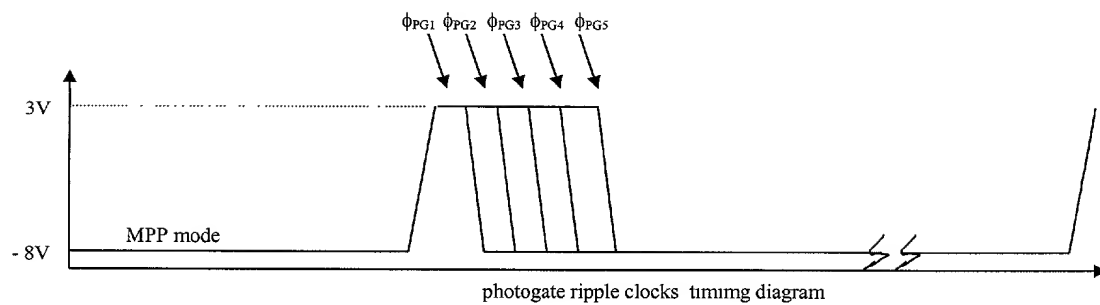
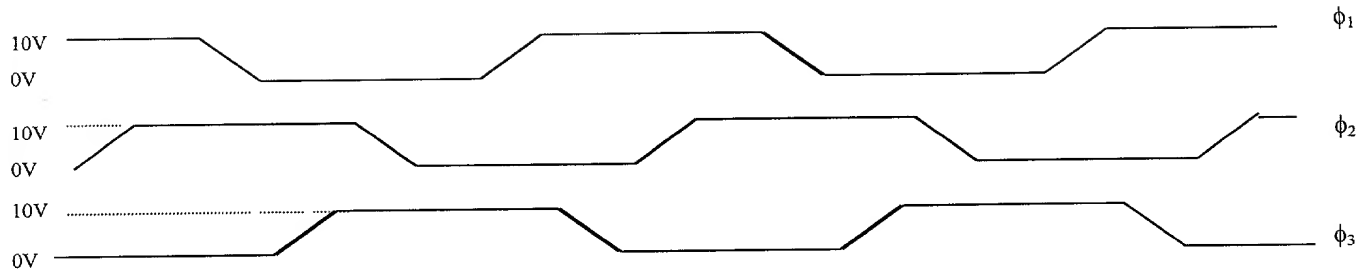
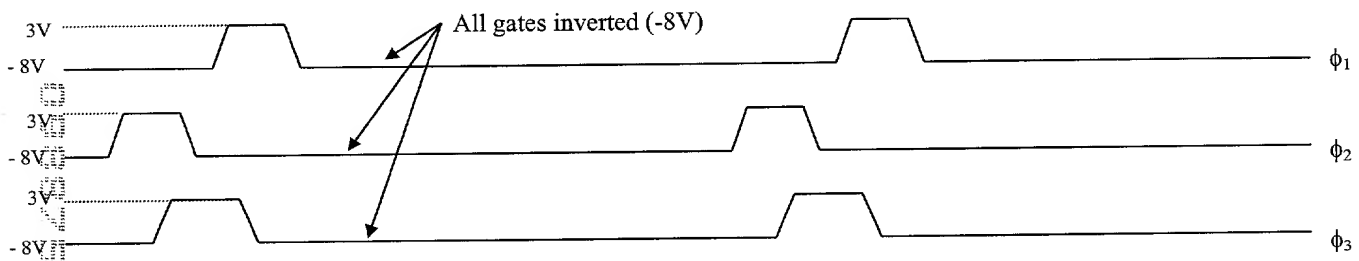


Fig. 14

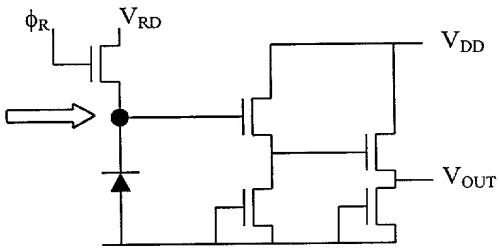


(a) Non-MPP continuous clocking of a 3-phase linear CCD

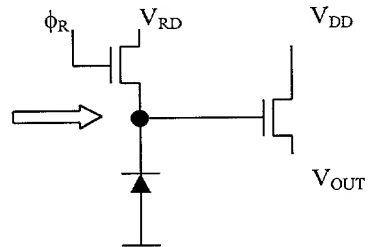


(b) MPP burst clocking of a 3-phase linear CCD

Fig. 15



(a) dual-stage amplifier for linear CCD
(prior art)



(b) single-stage amplifier for linear CCD

Fig. 16

Wide aperture
high sensitivity
photodetector
1602

Narrow aperture
low sensitivity
photodetector 1604

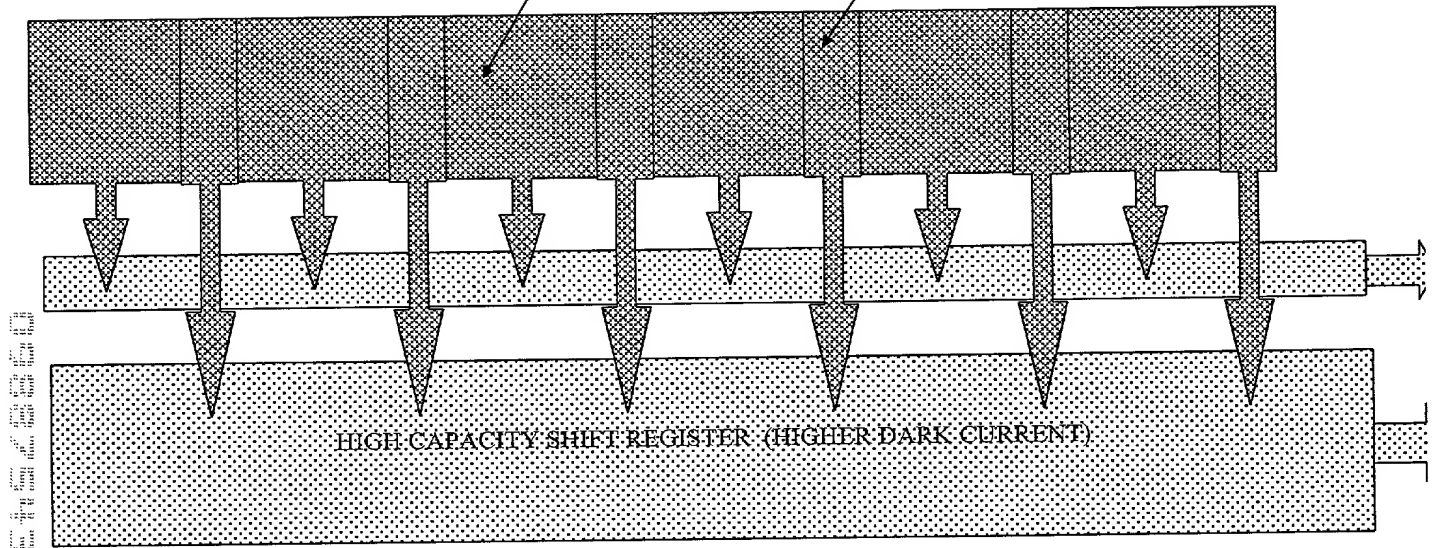


Fig. 17

High sensitivity
photodetector 1704

Low sensitivity
photodetector 1702

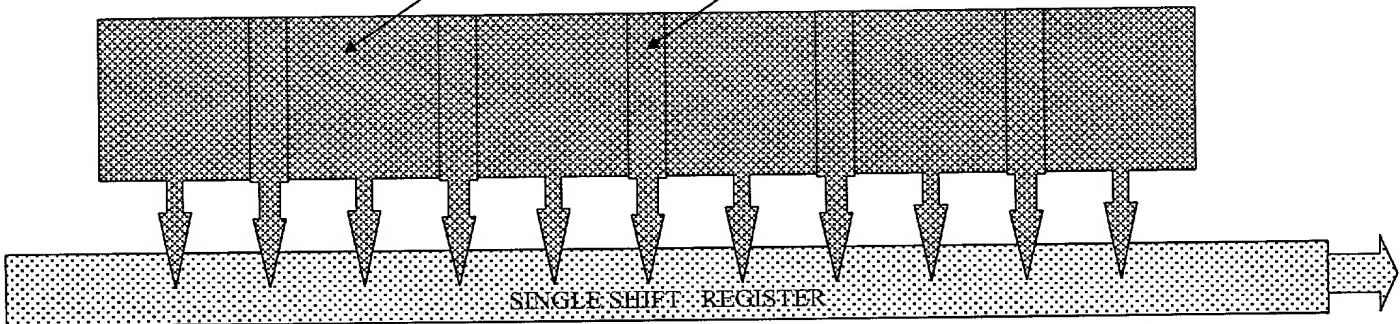


Fig. 18

Linear CCD specifications for storage-phosphor image plate reading

CCD architecture	Linescan (photosites & single register)
Photosite dimension	220 μm high x 44 μm wide (44 μm pitch)
Photosite design	5 photogates/pixel (44 μm high x 4 μm wide)
Shift register cell dimension	60 μm x 44 μm on a 44 μm pitch
Shift register design	2poly/2 ϕ or 4 ϕ switchable (with center split)
Shift register operation	Uni or bidirectional 2 ϕ or 4 ϕ (MPP mode)
Pixel count	2048 pixels
Die size	90.1 mm x 2.25 mm
Total dark current	< 20 pA/cm ² MPP mode at 25°C
Shift register dark current (MPP mode)	25e ⁻ /cell for 2ms integration at 40°C
Photogate charge transfer inefficiency (lag)	< 50e ⁻ at 1000 e ⁻ signal level
Well Capacity	10 ⁶ e ⁻
Amplifier readout noise	5 e ⁻ at 250 kHz (single-stage amplifier)
Output configuration	1 or 2 outputs in split mode (opposite ends)
Effective Quantum Efficiency (uncoated)	> 50% at 400nm (63% QE x 80% FF)
Effective Quantum Efficiency (AR coated)	> 75% at 400nm (94% QE x 80% FF)
Open photogate fill factor (no poly coverage)	> 80%
Maximum readout speed	500 kHz
Binning	4x
Charge Transfer Efficiency	0.99999
Buttability	3 side buttable (< 22 μm dead space)

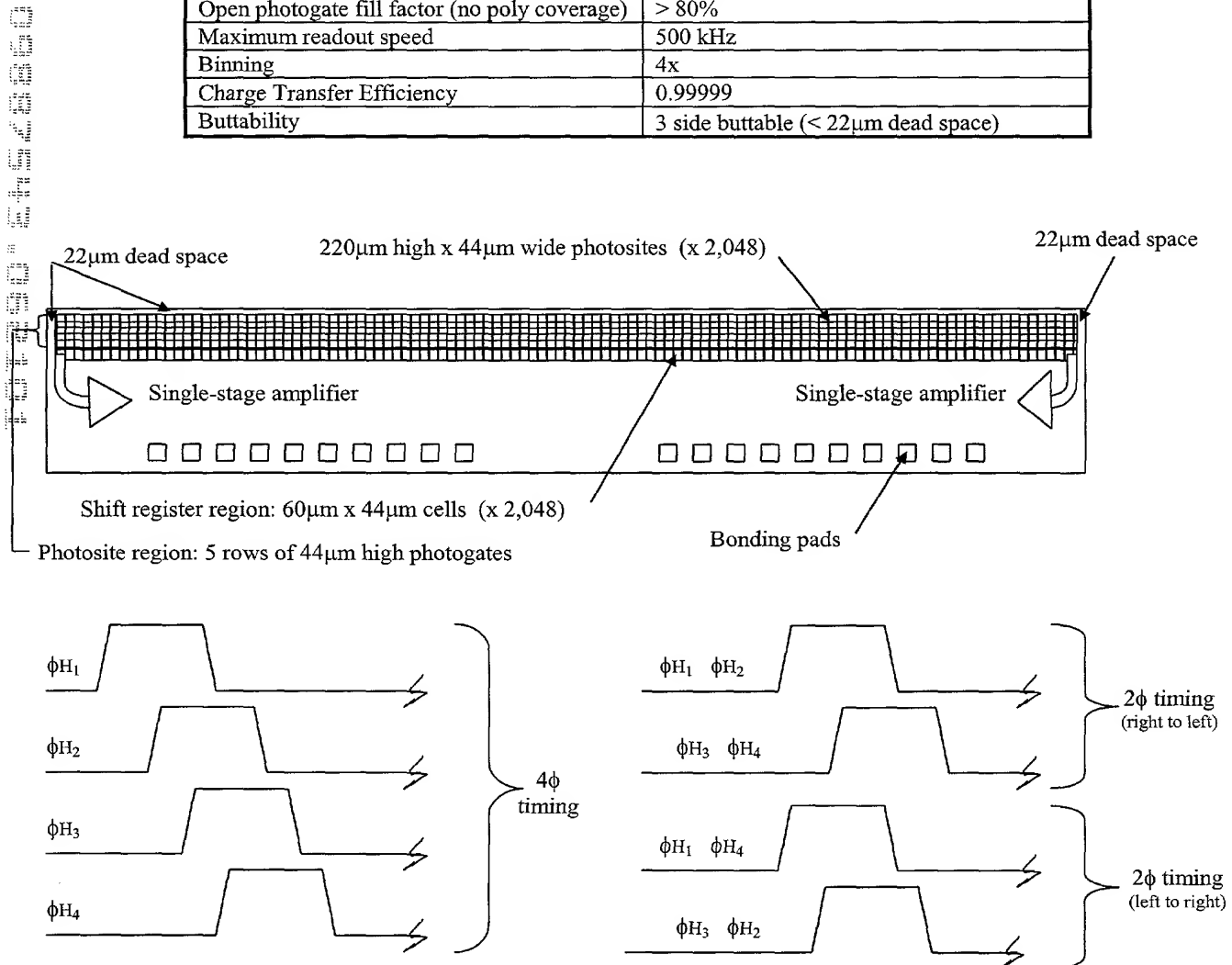


Fig. 19

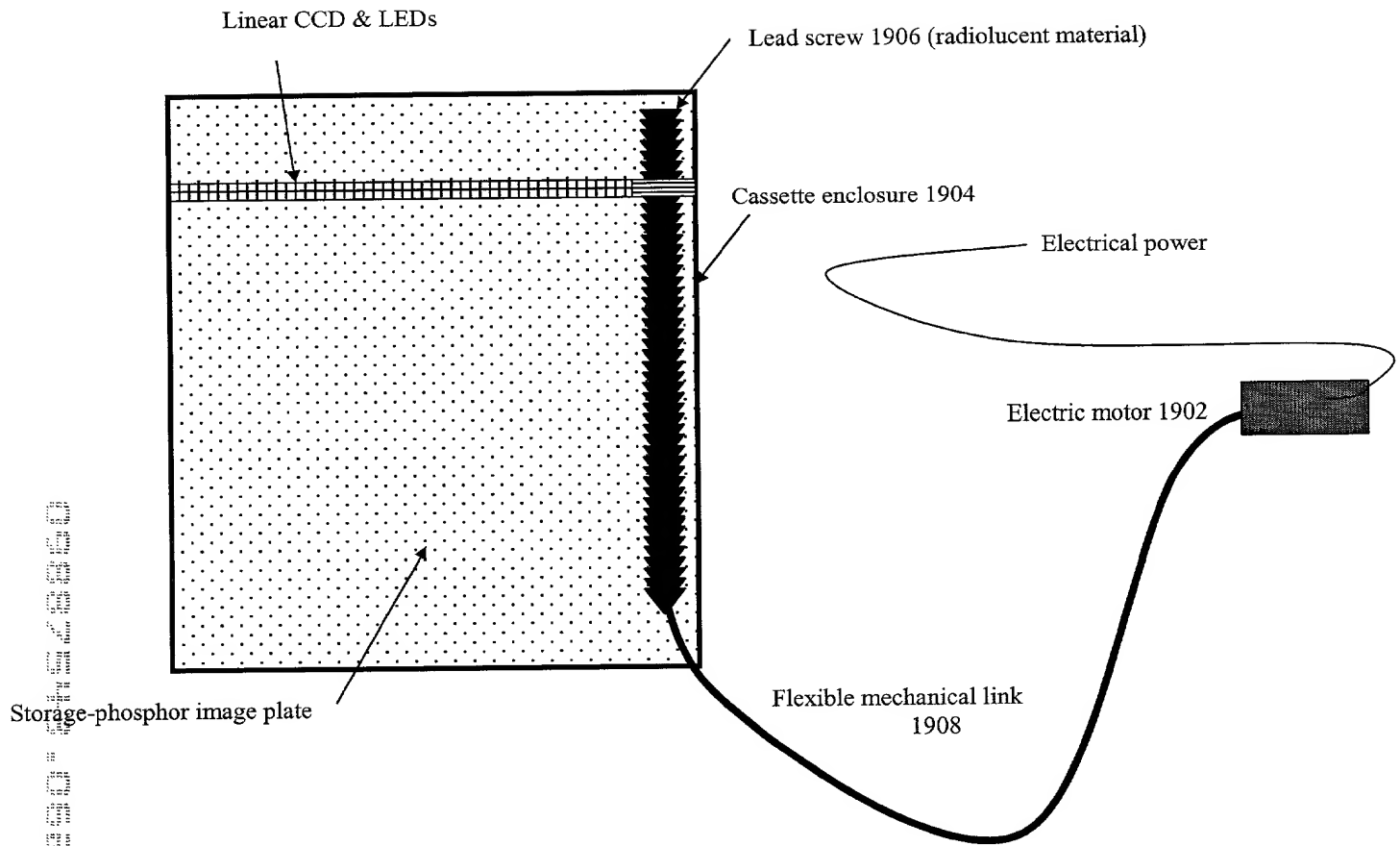


Fig. 20

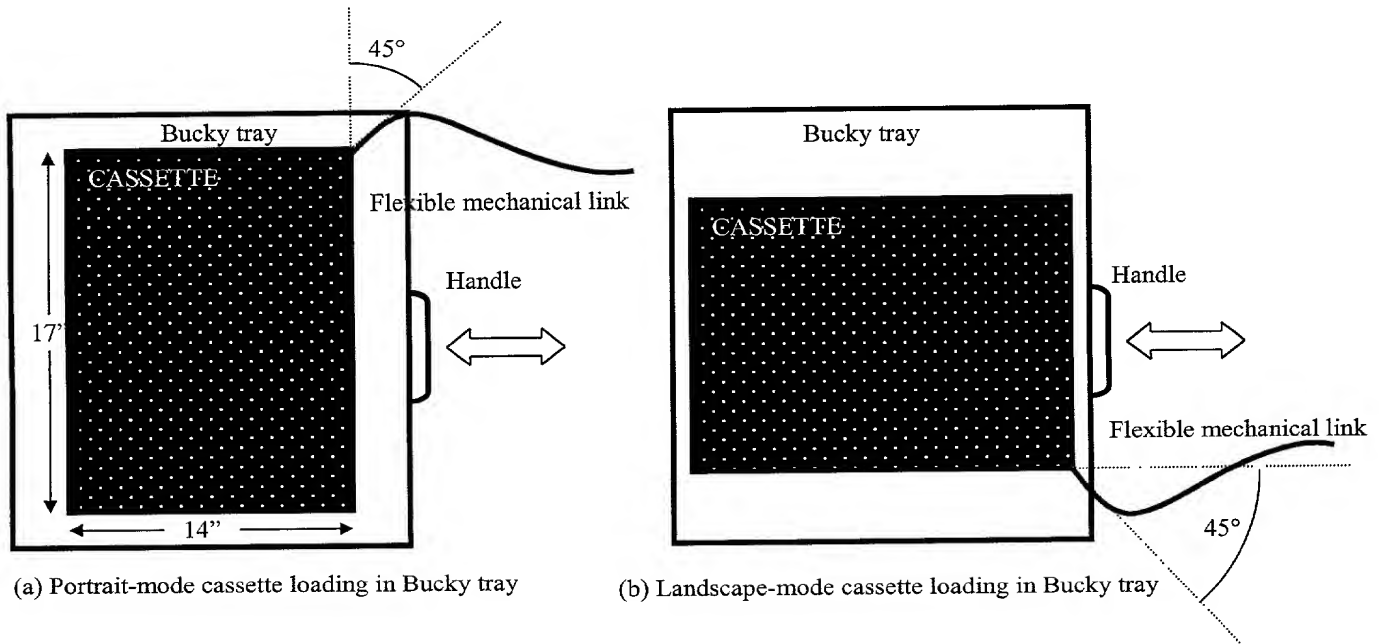


Fig. 21

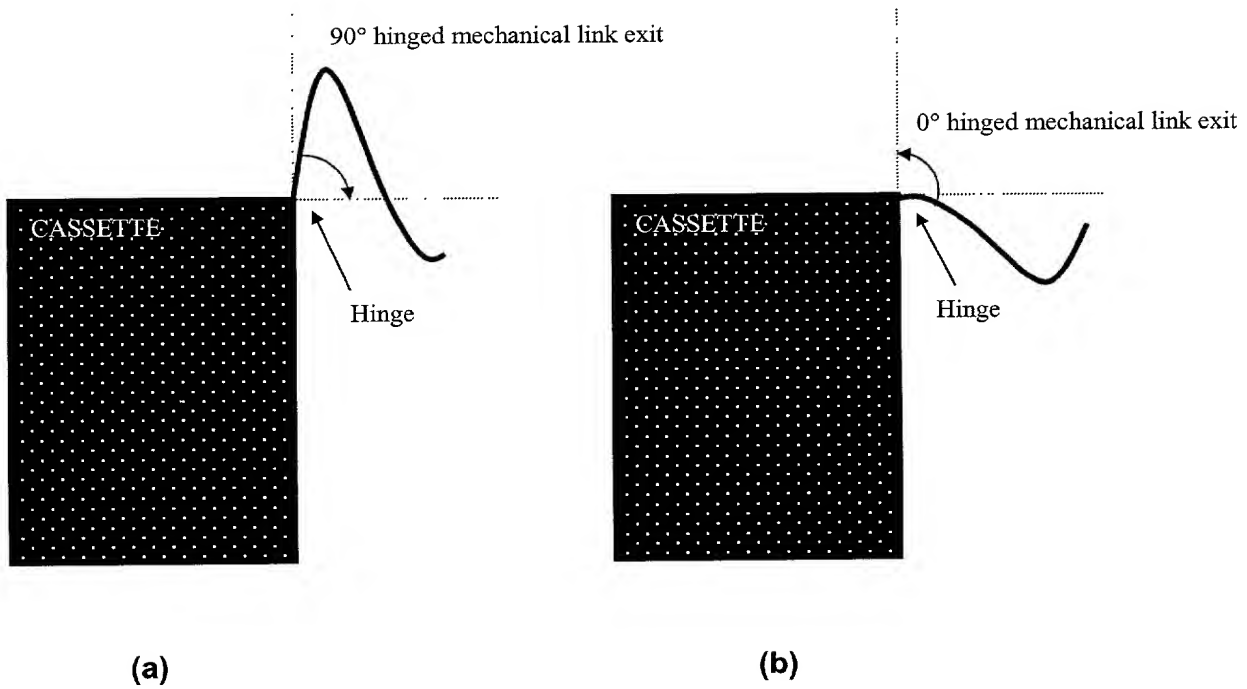


Fig. 22

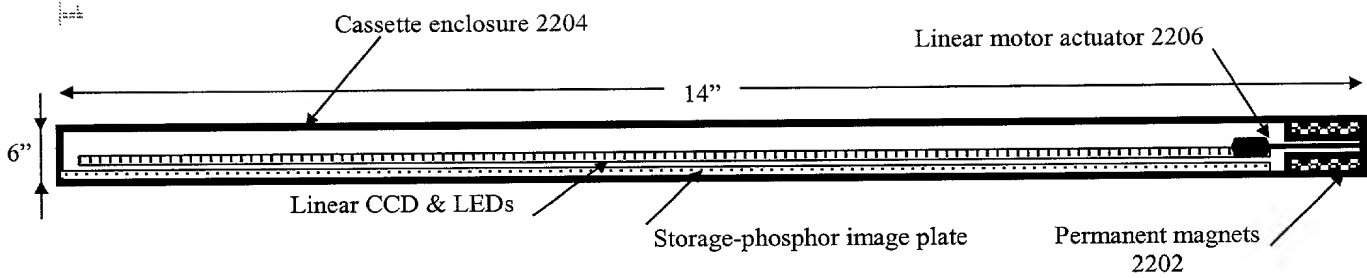


Fig. 23

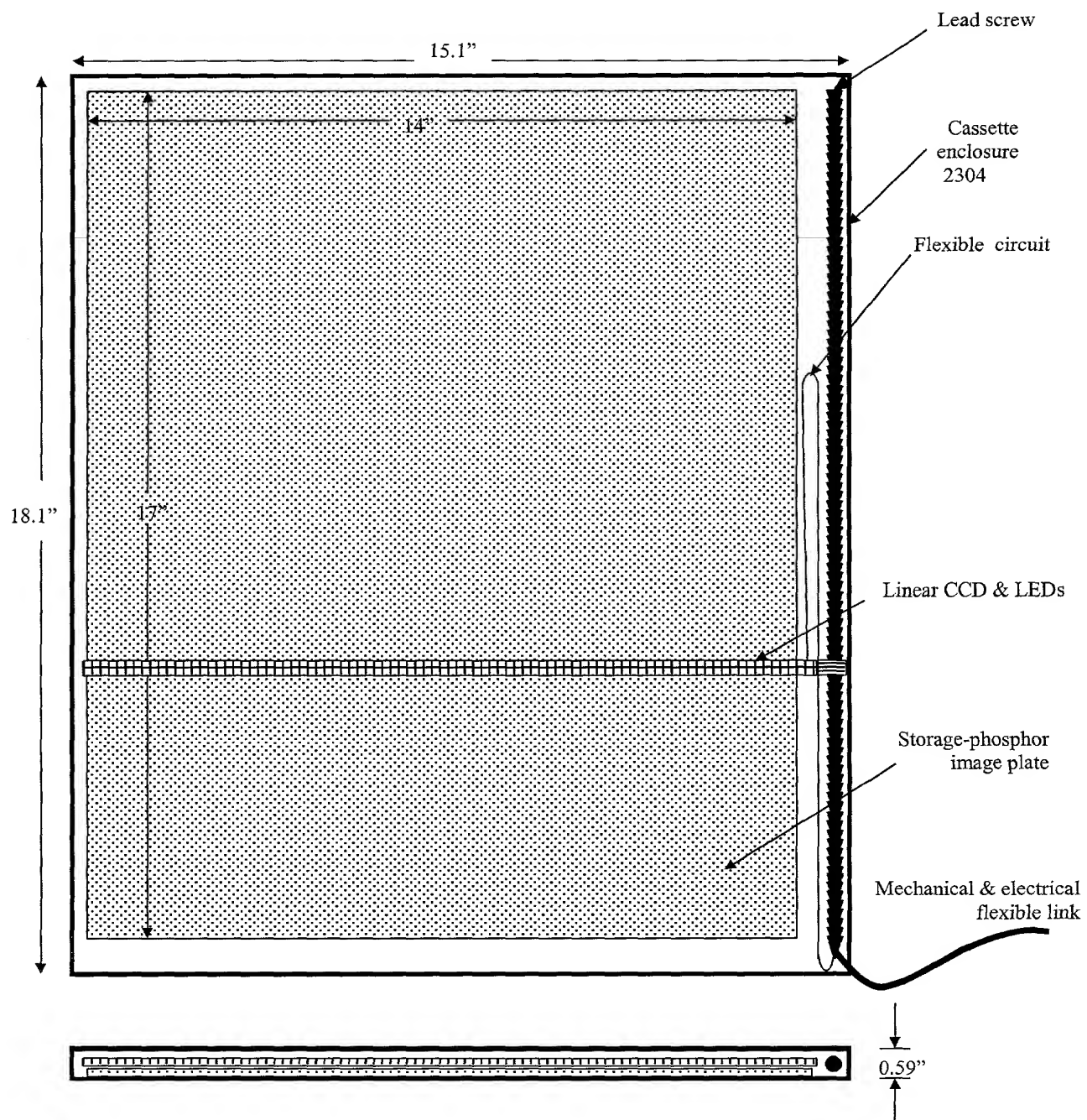
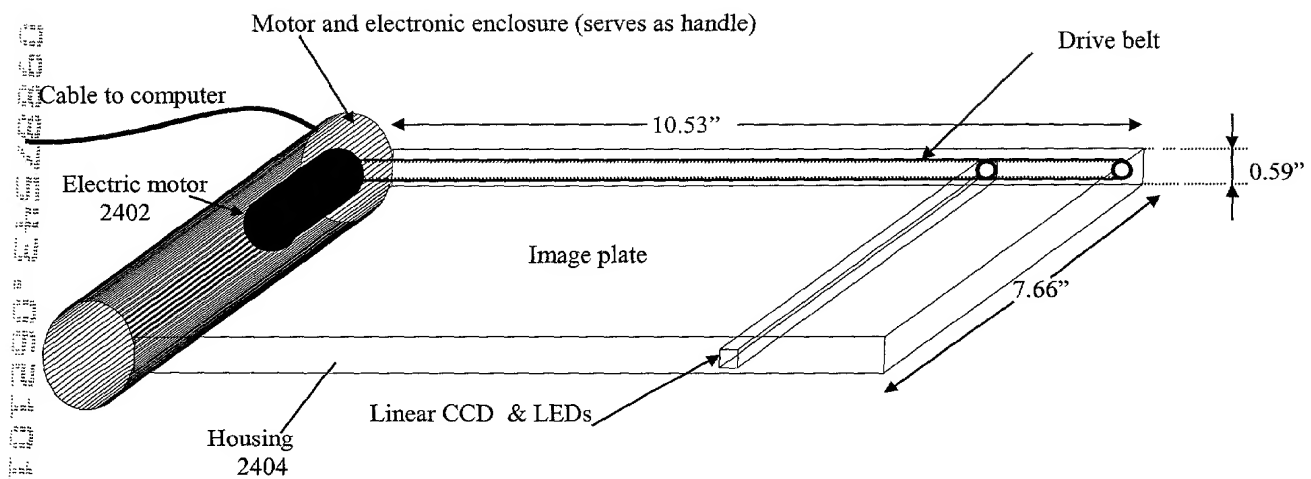


Fig. 24



Mammography cassette enclosure (fits in standard 18cm x 24 cm bucky)